

**REMARKS/ARGUMENTS**

The Examiner rejects claims 4-10 and 27-41 under Title 35, U.S. Code 103(a) as being obvious over US 6,977,023 issued to Abrams.

Applicant respectfully disagrees.

The Examiner argues that: (a) '023 to Abrams is a "generic disclosure of polyester flock fibers in a decorative flock transfer that is dyed with a sublimation process"; (b) "it would have been readily obvious to select a specific known polyester composition (e.g. PCT) for a generic disclosure of polyester flock fibers" "based upon the suitability of [the polyester} composition for the intended use", namely dying in a sublimation process; (c) it would be obvious to one of ordinary skill in the art to use PCT under exposure to heat to provide a fiber that maintains its resiliency due to its inherent thermal stability and resilient properties; and finally (d) the selection of PCT for its "intended use would be entirely obvious" and meets the standard of "*In re Leshin*".

The Examiner's statement argument is flawed. It assumes that polyesters are suitable for dye sublimation. That is not the case. Prior to Applicant's invention, one of ordinary skill in the art would find no polyester suitable for sublimation printing. Some polyesters, such as poly(ethylene terephthalate), can hold the dye but have little loft retention and flatten out during sublimation printing. Other polyesters typically melt or soften and deform under the high temperatures experienced during sublimation printing, losing desirable tactile characteristics (soft touch). Nylon and rayon fibers, though having loft retention, generally are unable to accept the vaporized dye consistently and/or permanently and therefore produce an irregular and/or unstable colored product. Abrams discloses, as flock, only nylon, polyamide, and polyester. (Col. 9, lines 39-42.) As a result, precolored flock fibers are used. Precolored flock fibers are colored during manufacture by including dyes and/or pigments in the polymer resin from which the fibers are formed.

Moreover, Abrams is *not* prior art. Abrams is not prior art under 35 U.S.C. §102(a) or (e) because the current application and the '023 patent have the same inventor, namely Louis Brown Abrams. Abrams is also not prior art under 35 U.S.C. §102(b). The PCT corresponding to the

'023 patent and the '023 patent itself were published April 13, 2003. The subject application was filed July 3, 2003. Nor is a foreign counterpart of the '023 patent prior art under subsection (d) as neither the '023 patent nor its corresponding PCT application was not filed in any foreign country.

Even if polyester flock fibers have been sublimation printed in the past, Applicant respectfully submits that the physical properties of PCT teach away from its use as a sublimation dyeable flock fiber, and it is this surprising and unexpected finding that PCT is a superior sublimation dyeable fiber. Applicant additionally submits that surprising and unexpected benefits are achieved when PCT flock fiber is dyed by means of a sublimation process.

Contrary to the Examiner's statements, the physical properties of PCT suggest to one of ordinary skill in the art that it is a poor candidate for sublimation dyeing. According to the teachings of the prior art, the thermal properties of PCT would suggest that PCT is a poorer candidate than PET for sublimation dyeing. As noted, PET is a poor dye acceptor. During the sublimation dyeing process the polymer must "open up" to accept the vaporized sublimation dye, then when cooled the polymer must retain the "entrained" dye. The glass transition temperature,  $T_g$ , and melt temperature,  $T_m$ , of PCT are, respectively, 90° and 290° C. While, the glass transition temperature and melt temperatures of PET are 76° and 250° C, respectively. As such, PCT is expected to be more difficult to "open up" and accept a sublimation dye than PET. At the glass transition temperature the amorphous regions within a polymer become "glassy," that is, the molecular segments of the polymer comprising the amorphous regions become more mobile and move around more easily, and as the temperature increases even more above the  $T_g$  the molecular segments within the amorphous regions become even more mobile and move around even more easily. The melt temperature is the temperature that the crystalline regions of the polymer become a disordered liquid. At a given temperature (above the  $T_g$  of PET) the amorphous regions of PET are expected to be better dye receptor regions than PCT and at any given temperature (above the  $T_m$  of PET) the crystalline regions of PET are expected to be better dye receptor regions than PCT. The lower  $T_g$  and lower  $T_m$  for PET is, according to the prior art,

expected to be a better candidate than PCT for sublimation dyeing; that is, the vaporized sublimation dye would be expected to penetrate (be absorbed by) the more mobile amorphous regions and more disordered liquid regions of PET, as compared to PCT which has less mobile amorphous regions and less disordered crystalline regions than PET. Notwithstanding the above properties Applicant unexpectedly found PCT to be a better sublimation dye acceptor than PET.

Dyes are typically aromatic molecules, as such, the higher aromatic weight percent of PET, 39 wt%, versus PCT, 28 wt%, suggests that PET would be more likely to accept and retain typical aromatic sublimation dyes than PCT; aromatic materials are better at accepting and retaining other aromatic materials. The finding that PCT accepts and retains sublimation dyes better than PET is unexpected and teaches away from the art.

The Applicant wants to particularly point-out to Examiner that the only independent claim being presented is directed towards a method of sublimation printing a specific cyclic terephthalate polymer flock fiber, that the Applicant unexpectedly found to have sublimation dyeing properties that teach away from the prior art. Applicant respectfully submits that independent claim 4 more than meets the requirements of patentable material; it teaches away from the prior art, the benefits achieved were surprising and unexpected to those of ordinary skill in the art, and the benefits achieved were previously unattainable within the art. The remaining claims that depend from independent claim 4 are patentable due to their dependency on allowable claim 4 and they further specifically point out and distinctly claim the invention.

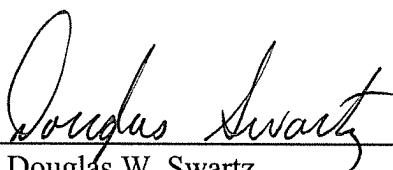
In addition to the respective submission of Applicant's arguments, Applicant is filing concurrently herewith a declaration from two experts, namely Dr. Keep and Mr. Haile, in the area of the PCT polymers. These experts qualify as being one of ordinary skill in the art and concur with the applicant that the sublimation dyeing characteristics of PCT flock found by the Applicant are surprising and unexpected based on the physical and chemical properties of PCT. Applicant monetarily compensated Dr. Keep and Mr. Haile for their time to prepare the declaration.

*Application Serial No. 10/614,340*  
*Reply to Office Action of January 25, 2007*

Based upon the foregoing, Applicants believe that all pending claims are in condition for allowance and such disposition is respectfully requested. In the event that a telephone conversation would further prosecution and/or expedite allowance, the Examiner is invited to contact the undersigned.

Respectfully submitted,

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